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Information Requirements Determination for Electronic Retailing: A Consumer-based Perspective

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Abstract

A method for obtaining information requirements for electronic retailing sites in a manner that would be quicker and more reliable than interviewing actual site users while still meeting the needs of the consumer is presented. The information requirements are delineated in terms of information volume, type and format needed to incorporate desirable design and navigation features into web sites.

Introduction

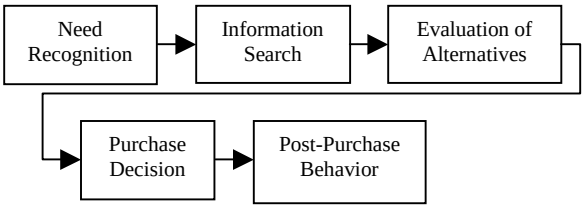
Because of the focus on supporting technologies and architectures, previous research in business-to-consumer electronic commerce has not elaborated sufficiently on the users of the sites. When looking at the area of electronic retailing we need to consider the consumer and the information system that will be used by the consumer. The concept of Information Requirements Determination (IRD) has long been used in Systems Analysis and Design to allow developers to design systems that will match the needs/desires of users of those systems (Hoffer, George, & Valacich, 1998; Whitten & Bentley, 1998).

IRD is concerned with providing methods for analysts to determine the information requirements of users. Most of the techniques require some form of personal or person-to-person contact that may or may not be feasible or desirable in designing a system to be used by consumers in an electronic retailing situation. A traditional approach to the design of an information system would consist of contacting current or potential users and eliciting requirements from them. Users in an electronic retailing environment are not traditional users who are employees of an organization but are consumers who are both external to organization and essential to its ultimate success.

One possible approach is to view the consumer as external to the organization and then compare the development of an electronic retailing site to new product development. Yet, in idea screening for new product development, marketers have found that direct methods are not always best (Keegan, Moriarty & Duncan, 1995). Many times, when faced with a new situation, consumers are unaware of what their needs are or what the technological limitations are. Actual contact with potential users (consumers) would result in significant expense in the form of time and money. Also, the quality of the system would be highly dependent on the quality of the sample of customers that were used in the analysis.

A model that can provide insights into the information requirements of consumers participating in electronic retailing is needed. The Model of the Buyer Decision Process (BDP) (Figure 1), a model proven useful in the area of consumer behavior (Wilkie, 1994; Kotler & Armstrong, 1996), can be applied to gain significant insights into the design of business-to-customer electronic commerce applications. This parsimonious model can be used to aid the determination of specific information requirements of consumers, by stage, in an electronic retailing environment.

Figure 1. Model of the Buyer Decision Process



Need Recognition. Need Recognition occurs when consumers realize a difference between their actual and desired states. Need recognition often leads to need activation, which can occur through several different mechanisms including the passing of time, changed circumstances, product acquisition, product consumption, individual differences, and marketing influences.

Information Search. Once need activation has occurred the consumer can potentially search for information on a product or service that satisfies the known need. The amount of search will depend on several factors including: the cost of the purchase, the cost of obtaining information, the ease at which more information can be obtained, the level of involvement a customer has with the product, the customer's prior experience with the product, and the level of satisfaction an individual gets from the search process.

Evaluation of Alternatives. In this stage, the customer compares products to come up with a desired alternative. The comparison occurs along dimensions (product attributes) that are considered to be important to the consumer, often using a set of decision rules.

Purchase Decision. Product purchase may occur in this stage if a positive decision is reached. Subsequent activities include placing an order, paying for the product, and arranging for and accepting delivery of the product.

Post-Purchase Behavior. Once the product has arrived and the consumer has begun to use the product, he/she again starts an evaluation process to determine how well the product matches the desires/expectations

that the consumer had for the product. The results of this evaluation process will have an impact on the future purchase behavior of this person. After-the-sale service and support are also important factors in this final stage.

By considering all of the stages in the BDP we can begin to understand how consumers search for and use information in the process of conducting an electronic retailing transaction.

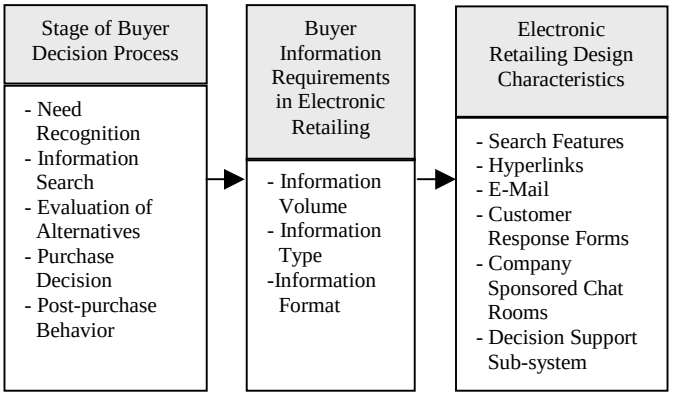
A Consumer-based Model of IRD for Electronic Retailing

The objective of this research is to expand current thoughts on determining information requirements for electronic retailing through a consumer-based perspective. The addition of the customer-based perspective will allow researchers to better understand electronic retailing and give system developers a more comprehensive method of designing and evaluating their ventures in electronic commerce.

Current IRD methods and tools are geared more toward a known pre-defined group of predominantly internal users who are accessible to the information system analysts and designers. Consumers are traditionally not as intimately involved with the system design process therefore, researchers need to devise techniques that can support IRD for the absent or hard-to-reach users of electronic retailing. Information contained in the Model of the BDP can be applied to help fill this gap.

A model of information requirements determinination for electronic retailing is presented in Figure 2. This model uses the buyer decision process as the basis for determining the information requirements of buyers in electronic markets. System charateritics for electronic retailing are derived from the unique consumer information requirements associated with each stage of the buyer decision process. By applying the concepts found in this model, one can develop an overall strategy for designing web sites that successfully lead a consumer through each stage of the decision-making process, therefore increasing sales revenue for the firm.

Figure 2. Consumer-based Model of Information Requirements Determination for Electronic Retailing.



When applying this model, a developer must consider the organization's knowledge of its customers, including customer needs. The developer must make determinations as to web design, including navigation features that would support delivery of the appropriate information to the consumer at each stage of the buyer decision process. Each stage in this process has specific information requirements as to volume, type, and presentation format that are desirable for successfully leading a customer through the decision-making process. Specific information needs to be considered in each decision stage are described below and in Table 1.

Need Recognition. Information should trigger interest in the product.

Information Search. The categories of information that have been identified as useful in this phase include: price or value, quality, performance, components or contents, availability, special offer, taste, package or shape, guarantee or warrantees, safety, nutrition, independent research, company-sponsored research, and new ideas (Resnik & Stern, 1977). The needs and wants of customers will decide which of these categories should be included on the company web site. A recent study of corporate web sites indicated that these cues are not being used sufficiently (Salam, Rao & Pegels, 1998). A limited search is likely to take place for a low involvement product whereas more extensive searches will be undertaken for high involvement products.

Evaluation of Alternatives. Information necessary to evaluate a high involvement product includes: alternatives to the chosen product, a method to compare the products on chosen evaluative criteria, and the appropriate decision rules for the given product category.

Purchase Decision. Information necessary to complete the purchase is needed. If electronic ordering is not an option, consumers should be pointed to an 800 number or address (either mailing or a retail location).

Post-purchase Behavior. Along with his/her experience with the product a consumer may also turn to other sources to provide information confirming their assessment. For most major purchases, consumers experience cognitive dissonance, or discomfort, caused by having made the purchase (Kotler & Armstrong, 1996). This may result from drawbacks they have realized in the chosen product or the loss of benefits that would have been provided by alternative products. Therefore, the consumer requires information to help them validate their decision.

By using the buyer decision process as an information requirements determination tool, a company can increase the utility provided to customers by the retail web site through the user-determined information provided. Table 1 shows the links between the BDP and Information Requirements.

Table 1. BDP-Based Information Requirements for Electronic Retailing.

Stage of the Buyer Decision Process	Information Volume Required	Information Type Required	Information Presentation Format Required
Need Recognition	Relatively Little	Information on the Specific Need Met by the Product	Minimal Pictorial, Graphic, or Textual
Information Search	More Information	Information on Products and the Product Category	Heightened Attention-Simple Textual Arguments, Bullet Lists Active Search-Extensive Graphic and Textual Info
Evaluation of Alternatives	Most Information	Information on All Products Considered for this Purchase	Low Involvement-Order Form High Involvement-Tables, Graphs, Comparison Charts
Purchase Decision	Less Information than Prior Stage	Information Specific to the Purchasing Process	Text Graphics Pictures
Post-purchase Behavior	Less Information than Prior Stage	Specific Information to Allay Concerns over Purchase Decision	Tables Graphs Multi-media

Table 2. BDP-Based Design Guidelines for Electronic Retailing.

Stage of the Buyer Decision Process	Electronic Retailing Design Guidelines
Need Recognition	- Place Factors Leading to Need Activation on Home Page - Use Banner Ads - Embed URL in Advertisements
Information Search	- Provide Home Page Link to Specific Product Information - Provide Information on Product Attributes - Use Internal Search Engines to Aid in Information Location - Provide Links from External Search Engines
Evaluation of Alternatives	- Provide Links to Other Sources of Product Assessments - Provide for Cross Comparisons with Similar Products - Provide Consumer Decision Support Systems for Application of Decision Rules - Provide Links for Obtaining Further Information
Purchase Decision	- Provide Electronic Ordering Capability - Provide Customer Response Forms - Electronic Purchase Confirmation - Company 800 Numbers
Post-purchase Behavior	- Provide E-mail Link for Customer Questions Concerning Orders - E-mail Confirming Wisdom of Product Choice - Provide Links to Testimonials from Satisfied Customers - Sponsor Chat Rooms for Customers

Table 2 shows Design Guidelines that can be applied by a company to develop a more comprehensive web presence than might be designed using traditional IRD tools and techniques.

Many previously published methods for the development of web sites are not as detailed as the above-proposed model. These sources tend to advocate very general guidelines that web developers should use such as the text being concise, easily understood, complete, and accurate (Conger & Mason, 1998). Guidelines such as this are very general and less specific than the Consumer-based Model of Information Requirements Determination for Electronic Retailing. Other models (Alexander & Tate, 2000) tend to not provide detail as to the amount information that is needed and the characteristics that the information should have (type and format) leaving it to the web developer to determine the meaning of terms such as complete and accurate. Without expertise in marketing and consumer behavior the developer may be unsure as to the definitions of these terms. An added advantage to the proposed model is that it is tailored to a specific type of application, electronic retailing. This should lead to better fit between the consumer's tasks in electronic retailing and the technology supporting that task. Research has shown that task- technology fit leads to superior performance (Goodhue & Thompson, 1995).

Conclusions and Future Research

Improvements will occur in IRD for electronic retailing when using the Consumer-based Model of Information Requirements Determination for Electronic Retailing as compared to tools and techniques that are currently being used in Systems Analysis and Design. Using this model as a tool for IRD, a company can better understand the information needs of consumers. By considering the ways in which consumers are likely to interact with the system and anticipate customer information needs, the capabilities of electronic retailing web sites can be enhanced. Four objectives can be met by delineating the steps in the buyer decision process and focusing on consumer information needs. First, it will allow systems analysts to do a more thorough job of information requirements determination. Second, systems designers will be able to develop systems that are perceived as user-friendly and lead consumers through the buying process. Third, researchers will have a more complete framework for examining the area of electronic commerce. And fourth, an understanding of consumer behavior in electronic retailing will enhance future research in customer service and customer satisfaction in the electronic marketplace.

Empirical research must be conducted to validate the model and its application by applying the proposed model to design and implement retail web sites. The model was used to develop storyboards to demonstrate the feasibility of model. Future research includes comparing a site developed using this method to an existing electronic retailing site to determine the perceived differences in between the web sites. It is imperative that we understand all aspects of how consumers conduct business electronically. The Consumer-based Model of Information Requirements Determination is only one way that our understanding can be increased.

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